Space Weather Forecast

Issued on Thursday, 22 June 2023 at 01:02 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Minor/Moderate R1/R2 Radio Blackouts Likely throughout. Slight chance of Minor Geomagnetic Storm G1 Days 1 & 2.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Moderate in the last 24 hours, with a brief M1.1 flare observed at 21/1244UTC and originating from the same region that produced an X1 flare on the 20th. However there was also an unexpected M1 flare observed at 21/1538UTC, originating from a new region near the north central meridian. There are now up to fifteen sunspot regions on the visible disc, four of which are small and magnetically simple. Out of the rest, several are rather large and magnetically complex but two of them should be of particular attention. One in the north-west quadrant is growing in size and complexity but remains currently stable. The other one, near the north central meridian, came out of nowhere and may soon become a source of significant flares.

There are numerous 'filaments' (arcs of plasma) on the Sun at present although there is no evidence of any resulting CME in satellite imagery. At present then, there are no new confirmed Earth-directed CMEs.

Solar Wind / Geomagnetic Activity: The solar wind showed an ongoing weak connection to a 'coronal hole' fast wind. Solar wind speeds have been slightly elevated, gradually rising from 410 to 460km/s, briefly 480km/s. The number of particles in the solar wind was within its typical background range throughout, while its magnetic field was also at background. The north-south component was also weak. The net effect of the above solar wind measures was for Quiet geomagnetic activity with a provisional Unsettled interval in the 21-24UTC period.

Energetic Particles / Solar Radiation: No solar radiation storms were observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is expected to remain Moderate, with isolated or occasional M-class flares and a slight chance of X-class flares.

Solar Wind / Geomagnetic Activity: The geomagnetic forecast carries lower-than-average confidence. While mostly Quiet to Unsettled conditions are expected overall, there is a chance of an Active or even a slight chance of a G1/Minor Storm interval on Days 1 & 2 (22nd & 23rd), under the combined influence of the ongoing fast wind and also perhaps a glancing blow from some minor peripheral CMEs.

Energetic Particles / Solar Radiation: No solar radiation storms are expected, with a daily slight chance of S1 or greater.

Issued by Met Office Space Weather Advisor, Tel: +44 (0) 330 135 4254 Email: moswoc@metoffice.gov.uk

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	10	10	5	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	70	70	70	70
Very Active	R3 to R5 X	No	10	10	10	10

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	10	15	20	20
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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